

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (currently amended) A waveguide for use with an antenna aperture for forming a transition region for channeling electromagnetic wave signals, the waveguide comprising:

a tubular waveguide component having a tapering inner surface;

a dielectric member having a predetermined length and a generally conical profile, and inserted at least substantially into the tubular waveguide component to be at least substantially housed therein, the dielectric member having a base portion having a diameter about equal to an opening in the tubular waveguide component in which the base portion is inserted; and

wherein at least one of said dielectric member and said tapering inner surface comprises a surface that ~~is non-linear~~ forms a non-flat surface over its length.

2. (original) The waveguide for claim 1, wherein the dielectric member is comprised of a plurality of linear sections forming said generally conical profile;

3. (original) The waveguide of claim 1, wherein the tapering inner surface comprises a plurality of adjacently formed linear surface sections.

4. (original) The waveguide of claim 1, wherein the generally conical profile of said dielectric member comprises a gradually curving surface.

5. (original) The waveguide of claim 1, wherein the tapering inner surface of the tubular waveguide component comprises a gradually curving inner surface.

6. (original) The waveguide of claim 1, wherein the dielectric member is disposed concentrically within said tubular waveguide component.

7. (currently amended) The waveguide of claim 1, wherein said dielectric member has a ~~non-linear~~ non-flat outer surface and said tubular waveguide component has a ~~non-linear~~ non-flat inner surface.

8. (cancelled)

9. (currently amended) A waveguide comprising:
a tubular waveguide member having a tapering inner wall, said tapering inner wall forming a generally linear surface;
a generally conically shaped dielectric member disposed within said tubular waveguide;
wherein said generally conically shaped dielectric member includes an outer surface that is ~~non-linear~~ non-flat over a length thereof; and
the dielectric member having a base portion having a diameter that is about equal to an opening in said tubular waveguide member in which said base portion is inserted.

10. (currently amended) The waveguide of claim 9, wherein said outer surface of said dielectric member comprises a plurality of distinct linear sections formed adjacent one another to form said ~~non-linear~~ non-flat outer surface.

11. (original) The waveguide of claim 9, wherein said outer surface of said dielectric member comprises a smoothly curving outer surface.

12. (currently amended) A waveguide comprising:
a tubular waveguide member having a tapering inner wall, said tapering inner wall forming a ~~non-linear~~ non-flat surface;
a generally conically shaped dielectric member disposed within said tubular waveguide;
said generally conically shaped dielectric member including an outer surface that is ~~linear~~ flat over ~~[[a]]~~ an entire length thereof; and
said dielectric member including a base portion having a diameter that is about equal to an opening in said tubular waveguide member in which said base portion is inserted.

13. (currently amended) The waveguide of claim 12, wherein said tapering inner wall of said tubular waveguide member comprises a plurality of distinct linear sections forming said ~~non-linear~~ non-flat shape.

14. (original) The waveguide of claim 12, wherein tapering inner wall of said tubular waveguide member comprises a smoothly curving surface.

15. (original) The waveguide of claim 12, wherein said dielectric member is disposed concentrically within said tubular waveguide member.

16. (currently amended) An antenna comprising:
an aperture;
a waveguide in electromagnetic wave communication with said aperture;
said waveguide including:
a tubular member having a tapering inner wall surface;
a dielectric insert having an outer surface and a base portion, and
disposed at least substantially within said tubular member; and
at least one of said tapering inner wall surface and said outer surface of said
dielectric insert has a ~~non-linear~~ non-flat shape over a length thereof; and said base
portion having a diameter about equal to that of an opening in said tubular member in
which said base portion is inserted.

17. (original) The antenna of claim 16, wherein said tapering inner wall
surface of said tubular member comprises a smoothly curving shape.

18. (original) The antenna of claim 17, wherein said outer surface of said
dielectric insert comprises a linear surface.

19. (currently amended) The antenna of claim 17, wherein said tapering inner
wall surface of said tubular member comprises a plurality of distinct linear sections
forming an overall ~~non-linear~~ non-flat profile.

20. (original) The antenna of claim 16, wherein said outer surface of said
dielectric insert comprises a smoothly curving shape.

21. (original) The antenna of claim 20, wherein said tapering inner wall
surface of said tubular member comprises a linear surface.

22. (currently amended) The antenna of claim 16, wherein said outer surface of said dielectric insert comprises a plurality of distinct linear sections to form an overall ~~non-linear~~, non-flat, conical shape.

23. (original) The antenna of claim 22, wherein said tapering inner wall surface of said tubular member comprises a linear surface.

24. (currently amended) The antenna of claim 16, wherein said dielectric member has a ~~non-linear~~ non-flat outer surface and said inner surface of said tubular waveguide component is ~~non-linear~~ non-flat.

25. (currently amended) A method of channeling electromagnetic wave energy comprising:

forming a waveguide by disposing a dielectric insert within a tubular waveguide member;

forming one of an outer surface of said dielectric insert, and an inner surface of said tubular waveguide member with a ~~non-linear~~ non-flat shape; and

forming said dielectric insert with a base portion that is about equal in diameter to an opening in one end of the tubular waveguide member in which said base portion is inserted.

26. (original) The method of claim 25, further comprising disposing said dielectric insert concentrically within said tubular waveguide member.

27. (original) The method of claim 25, further comprising forming one of said outer surface of said dielectric insert and said inner surface of said tubular waveguide with a gradually curving, conical shape.

28. (currently amended) The method of claim 25, further comprising forming one of said outer surface of said dielectric insert and said inner surface of said tubular waveguide with a plurality of distinct linear sections disposed adjacent one another to form an overall, ~~non-linear~~ non-flat surface.

29. (cancelled)

30. (cancelled)

31. (cancelled)

32. (cancelled)

33. (cancelled)

34. (cancelled)

35. (cancelled)

36. (currently amended) A phased array antenna comprising:
a plurality of apertures; and
a plurality of waveguides in electromagnetic wave communication with said apertures;
wherein each of said waveguides includes:
a tubular member having an tapering inner wall surface and an opening at one end; and
a dielectric insert having an outer surface disposed at least substantially within said tubular member, and a base portion inserted into said opening; and
wherein at least one of said tapering inner wall surface and said outer surface of said dielectric insert has a ~~non-linear~~ non-flat shape over a length thereof, and said base portion has a diameter about equal to said opening.

37. (cancelled)

38. (cancelled)